

REMARKS

This *Amendment* is in further response to the Office Action dated March 23, 2005. Also enclosed is a *Declaration under 37 CFR 1.132 of Donald C. McCarthy*. The enclosed *Declaration* notes that unexpected, superior results are achieved in that an injection-molded parison made with a nanofiller exhibits unexpected and superior blow-molding processability into tumblers. Particularly pertinent in the *Declaration* are paragraphs 4, 5 and 6:

4. That, in his experience, a relatively high melt strength polymer material is required to blow-mold an article of manufacture such as a tumbler. Melt strength may be thought of as the ability of a molten composition to resist deformation as well as remain intact when drawn or expanded. The melt strength of a material determines how much deformation and stress a molten parison can endure without fracturing. Fillers generally form a separate phase in molten polymer compositions and do not deform in the same way as a molten polymer. Accordingly, fillers usually degrade the melt strength of a polymer composition.
5. That he has personally observed that suitable polymer materials made with nano-clay fillers such as montmorillonite exhibit increased melt strength as opposed to like unfilled polymers. This feature has been observed by noting that an unsupported, horizontally extruded film will maintain horizontal orientation over a longer distance than a film made without nano-filler. This result is an unexpected, superior result in terms of processability of filled polymer materials for injection blow-molding because it is seen that nanocomposites have superior melt strength over polymer compositions without nano-filler.
6. That he has personally observed that polymer materials made with nano-filters are readily blow-molded into articles of manufacture, confirming the results noted above that nano-filters can actually increase melt strength.

The unexpected, superior results are believed to warrant allowance in any event, especially because the art contains no suggestion that nanocomposites are especially suitable for blow molding tumblers. Pertinent in this regard is *In re Soni*, 34 USPQ2d 1684, 1687 (CAFC 1995):

Mere improvement in properties does not always suffice to show unexpected results. In our view, however, when an applicant demonstrates substantially improved results, as Soni did here, and states that the results were unexpected, this should suffice to establish unexpected results in the absence of evidence to the contrary. Soni, who owed the PTO a duty of candor, made such a showing here.

As noted by Dr. McCarthy, relatively high melt strength of a material is ordinarily required for blow-molding inasmuch as the parison must be expanded into the desired shape without bursting or otherwise fracturing. It is well known in the polymer art that fillers ordinarily degrade melt strength of a polymeric material. It is therefore unexpected and indeed surprising that nanocomposites are readily formed into tumblers by blow-molding.

The primary reference in the prior Office Action, *Maxfield*, describes a process of forming polymer nanocomposites. *Maxfield* describes a variety of shaping processes and potential articles made from nanocomposite polymers. However, the reference does not remotely suggest or teach blow-molding of tumblers. *Note Maxfield*, p. 37-38:

The nanocomposite compositions according to the
invention are thermoplastic and, in some cases,
vulcanizable materials from which molded articles of
manufacture having valuable properties can be produced
35 by conventional shaping processes, such as melt
spinning, casting, vacuum molding, sheet molding,
injection molding and extruding. Examples of such

5 molded articles are components for technical equipment, apparatus castings, household equipment, sports equipment, bottles, containers, components for the electrical and electronics industries, car components,
10 circuits, fibers, semi-finished products which can be shaped by machining and the like. The use of the materials for coating articles by means of powder coating processes is also possible, as is their use as hot-melt adhesives. The molding compositions according to the invention are outstandingly suitable for specific applications of all types since their spectrum of properties can be modified in the desired direction in manifold ways. Such molded products of this

As seen above, *Maxfield* describes shaping processes such as melt spinning, casting, vacuum molding, sheet molding, injection-molding and extruding. However, ***blow-molding is not mentioned or suggested.***

The claims have been further amended to clarify that the inventive tumblers may be made by any blow molding technique which includes blow molding an injection molded parison.

New Claim 69 claims a specific embodiment including montmorillonite nano-filler. Support for new Claim 69 is found in the application as filed, p. 61, line 9.

This *Amendment* is supplemental to Applicant's response of July 22, 2005 and is believed timely. If additional extension or fees are necessary, please consider this a *Petition* therefor and charge any fees to Deposit Account No. 50-0935.

If fees for additional claims are due, please charge our Deposit Account No. 50-0935.

Respectfully submitted,



Michael W. Ferrell
Attorney for Applicants
Reg. No. 31,158

Ferrells, PLLC
P.O. Box 312
Clifton, Virginia 20124-1706
Telephone: (703) 968-8600
Facsimile: (703) 968-5500
August 9, 2005